

Analysis Findings

An in-depth description of the physical attributes of the study area, including mapping, is provided in Appendix A of this document. The following is a summary of the key attributes and findings as a result of the analysis, especially as they relate to, or impact the ability to undertake redevelopment activities. The analysis is organized around a ground-up approach. It looks first at the broadest geographically based factors such as geographic context, geology, hydrology, and soils. It then considers factors formed by the existing built environment, including land use patterns, transportation and utility infrastructure.

Study Area Context

The Borough of Carlisle is located in Cumberland County, Pennsylvania, in a region referred to as the Cumberland Valley. Carlisle is well-located along the key intersection of the I-81 and Pennsylvania Turnpike/I-76 transportation corridors which serve and provide access to major portions of the mid-Atlantic region. Carlisle is approximately 22 miles southwest of the City of Harrisburg, approximately 120 miles to the northwest of Washington, D.C. and some 90 miles from Baltimore, Maryland. Carlisle is the county seat of Cumberland County and as such serves as a major business and governmental activity center for the region.

Study Area

The study area boundary includes a large area as depicted on the Study Area Map (shown on Page 8). The emphasis of this planning effort focused on the former industrial areas, their surrounding neighborhoods and the strategic infrastructure locations and corridors that serve them. It is important to note that the study area includes a portion of North Middleton Township along the US Route 11/N. Hanover Street corridor, which is directly adjacent to the 759 Hamilton Street redevelopment site.

Topography

Most of the study area is flat, with limited changes to topography, which makes the area conducive to development activities. To a large extent the topography of Carlisle consists of subtle undulating landforms which can also create areas of flooding due to poor drainage. This is best exhibited where modifications to the landform were created, for example the slightly elevated railroad roadbed, which can create ponding in adjacent areas. Special considerations will be needed to address flooding areas to ensure proper drainage as sites are re-graded, especially after the large-scale demolition that has occurred on the former industrial sites.

Geology/Soils

Although often not readily apparent to the lay-person, geology and soil conditions can have a significant impact on development activities. Impacts can range from the ability to build structures, the types of building foundations required, to the ability to manage on-site stormwater and special actions needed avoid sink holes.

A large portion of Cumberland County, including Carlisle Borough and especially within the study area, is underlain with a form of limestone that is prone to rapid erosions, primarily from concentrated surface or groundwater flow. These formations present several different challenges, both structurally and hydrologically. They may require special engineering analysis be performed when designing large structures and will require special treatments for the design of stormwater management facilities.

New stormwater management systems such as rain gardens will likely require controls to limit the amount of concentrated infiltration of water into the ground, thereby limiting the potential for limestone erosion and sink hole development. These systems are referred to as “detention” systems versus “retention” systems which promote direct groundwater recharge.

Hydrology

Carlisle Borough is located in the Lower Susquehanna sub-basin. As a result, it is part of the Chesapeake Bay watershed and therefore subject to the guidelines set forth by the Chesapeake Bay Program. Much of the study area and the Borough as a whole drains into Letort Spring Run. The Letort Spring Run flows from the south to the northeast through the Borough of Carlisle and drains into the Conodoguinet Creek and ultimately into the Susquehanna River, near the City of Harrisburg.

Much of the study area drains to Letort Spring Run at two key points within the area of the Army War College property. Letort Spring Run has some prevalent flooding issues, especially in downtown Carlisle, primarily east of N. Hanover Street in the areas near Letort Spring Run. Within the study area, flooding has been reported along Fairground Avenue, south of A Street. There are also several low depressions with day-lighted stream areas between PA Route 34/Carlisle Springs Road and Clay Street, in the area of C Street. With regards to the overall flooding characteristics of the Letort Spring Run watershed, a majority of the flooding issues are located upstream of the study area; however, it is important to minimize additional runoff as the run is clearly near its carrying capacity in some areas.

Sanitary Sewers

Unlike many older urban municipalities, the Borough has the benefit of separate sanitary and stormwater sewer systems. This means that the sanitary treatment plant is not subject to being overwhelmed during major storm events resulting in the bypassing of the plant and the direct discharge of raw sewage into the surface water bodies. The entire study area is served by public sanitary sewers. There are no capacity issues identified through the planning process related to the ability of the current sanitary sewer system to serve future redevelopment on the three former industrial sites. Existing on-site sanitary sewer conveyance systems on the former industrial properties will likely need to be replaced and should be located within existing or newly constructed public rights-of-way as part of land development projects.

Storm Sewers and Stormwater Management

Carlisle Borough has a dedicated stormwater sewer system. The area south of the Norfolk Southern Railroad line and east of Hanover Street is served by lateral lines that run west to east along North Street, Louthier Street, High Street and South Street (which extends west of Hanover Street to West Street). The majority of the study area located west of Hanover Street, south of the Norfolk Southern Railroad line, runs north via lines under Pitt Avenue and College Street to a large interceptor line that travels along Lincoln Street from west to east. This major sewer line continues eastbound through the southern portion of the IAC/Masland site, across PA Route 34/Carlisle Springs Road and ultimately to an outfall into Letort Spring Run. All of the stormwater runoff from the Carlisle Tire and Wheel site and the majority of the runoff from the IAC/Masland site drain into this major stormwater line.

The portions of the study area north of E Street drains entirely into a major storm sewer line that runs underneath Clay Street and then northeast along the 759 Hamilton Street site to Media Drive. At this point the line turns east and travels under Media Drive and a short stretch of U.S. Route 11/N. Hanover Street before it reaches its outfall with Letort Spring Run.

The three former industrial sites were almost completely covered with impervious surfaces in their recent state, prior to demolition. All of these sites are now subject to current stormwater management regulations which require significant detention capacity to be accommodated as a result of peak storm events. The opportunity exists through the integration of various pre-treatment and detention techniques such as: green basins; rain gardens; flow-through planters; soil cells; underground detention facilities; and grey water capture and re-use systems to achieve a significant net reduction in the stormwater runoff generated at each site while still supporting substantial, urban-style development patterns. Furthermore, the retro-fitting of existing infrastructure, specifically public streets such as Fairground Avenue, A, B, C and D Streets as they are improved, can broaden the applications of such techniques. This would create an area-wide approach to reducing the potential for flooding and also improve the overall environmental quality of the watersheds through the point-source removal of pollutants.

Utilizing a palette of Best Management Practices (BMPs) to handle stormwater as an interconnected “regional” chain of facilities which work together in an area-wide or regional approach will be the most cost effective and functional method to support creating an urban-style infill development. This approach reduces the need to meet standards on each individual parcel, yet ensures that the required net detention capacity is created through a common and combined system. The simplest way to achieve this is to create interconnected stormwater management facilities which are integrated into public parks and open spaces as well as through streetscape treatment and supported site specific rain gardens, flow-through planters, grey water detention/reuse systems and green roofs. A key aspect of these landscape oriented solutions is the requirement to design detention versus retention systems as a result of the karst geology and the potential that concentrated infiltration of stormwater could lead to the degradation of the limestone geology and cause potential sink hole related issues.

Dry Utilities

Due to demands of the former large industrial users in the area, there is ample supply of electrical and telecommunication systems. As with wet utilities, dry utility systems will likely need to be replaced in and around the former industrial sites and should be located underground within existing or newly constructed public rights-of-way as part of land development projects. In some cases, dry utilities could be located overhead via rear alleys; however, no above ground utilities should be permitted on newly constructed or upgraded public streets.

Land Use

The study area can be divided into a few key land use types. The bulk of the southern third consists of the mixed-use portions of the Borough's downtown. At the southwestern portion of the study area is Dickinson College. The remaining portion of the study area consists of various types of single family residential with minor commercial uses scatter throughout. The Carlisle Fairgrounds occupies a major portion of the northeastern portion of the study area along with a small cluster of commercial at the intersection of PA Route 34/Carlisle Springs Road and Clay Street.

The U.S. Route 11/N. Hanover Street corridor from Clay Street, to the northeast, is primarily suburban style commercial. There is also a small cluster of suburban format land uses in the triangle-shaped area between N. Hanover Street, Penn Street, Fairground Avenue and the Norfolk Southern Railroad railline. This area is especially inconsistent with the existing surrounding context as well as future mixed-use redevelopment on the former IAC/Masland site.

Residential density and lot sizes are generally smaller south of E Street including duplexes, townhomes and row homes, although single family detached homes are located throughout most of the study area.

The three former industrial properties total approximately 65 acres and represent a significant amount of land available for redevelopment or reuse, especially when considering the urban context and the close proximity to the downtown core commercial area of the Borough. Based on the surrounding land uses, mixed-use redevelopment on all of the sites would be compatible with the surrounding context.

Zoning

The existing zoning districts within the study area is fairly reflective of the existing land use patterns. The Borough has been progressive in updating its zoning ordinances to reflect current planning practices and legal

requirements as provided by the State of Pennsylvania's Municipalities Planning Code (MPC). The Borough recently adopted a new district designation, Urban Mixed Use (UM), which was designated for the bulk of the various parcels associated with the three former industrial sites. This ordinance established the basis for redevelopment planning. Specific revisions to the UM zoning district ordinance and design regulations should ultimately be checked for consistency with the recommendations of the Urban Redevelopment Plan (a detailed explanation of the proposed areas for modification are listed in Section 4).



Road Hierarchy Map

Transportation and Circulation

As illustrated on the Road Hierarchy Map (shown on page 19) the study area's transportation system is a traditional urban grid network comprised of three specific street design classifications: Arterial, Collector, and Local (as defined by Section 226-9 of the Code of the Borough of Carlisle). According to the Borough Code, an arterial street provides for the movement of high volumes of through traffic (>3,500 vehicles per day, VPD) and direct access to abutting properties subject to necessary control of entrances, exits, and curb use. A collector street provides for the movement of moderate volumes of traffic (1,500 – 3,500 VPD) between arterials and local streets and direct access to abutting property. A local street provides for local traffic movement with relatively low volumes (<1,500 VPD) and direct access to abutting properties.

The arterial streets serve as the backbone to the Borough's transportation system by accommodating high volumes of traffic into and through the Borough from points east, west, north, and south via High Street, Hanover Street, PA Route 34/Carlisle Springs Road, York Road, North College Street, and PA Route 74/Waggoner's Gap Road. The three former industrial sites are situated adjacent to several of these arterials, which strengthens their marketability by providing direct access to consumers located beyond the immediate Carlisle region.

Traffic Volumes

Most of the arterial streets located within the Borough and the study area are owned and maintained by the Pennsylvania Department of Transportation and are included in the Federal Highway Administration's Functional Classification System, which makes them eligible recipients of federal transportation funds. Table 1 provides a summary of the 2011 Average Annual Daily Traffic (AADT) volumes of the specified arterial streets. AADT is the typical daily traffic on a road segment for all the days in a week, over a one-year period. Volumes represent total bidirectional traffic flows. As such, the study area's primary street network generates approximately 75,400 average daily trips, which do not include higher trip peaks that are generated during special events, such as the Carlisle Event's car shows.

Table 1 - Study Area Traffic Volumes (Source: PENNDOT)

Street	Functional Classification	AADT (2011)
North Hanover Street	Principal Arterial	8,400 – 13,000
South Hanover Street	Principal Arterial	15,000
Spring Road (PA Route 34)	Minor Arterial	8,000
High Street	Minor Arterial	12,000 – 16,000
York Road (PA Route 74)	Minor Arterial	12,000
North Street	Urban Collector	4,500
North College Street/Waggoner's Gap Road (PA Route 74)	Urban Collector	6,500

Pedestrian Access And Connectivity Challenges

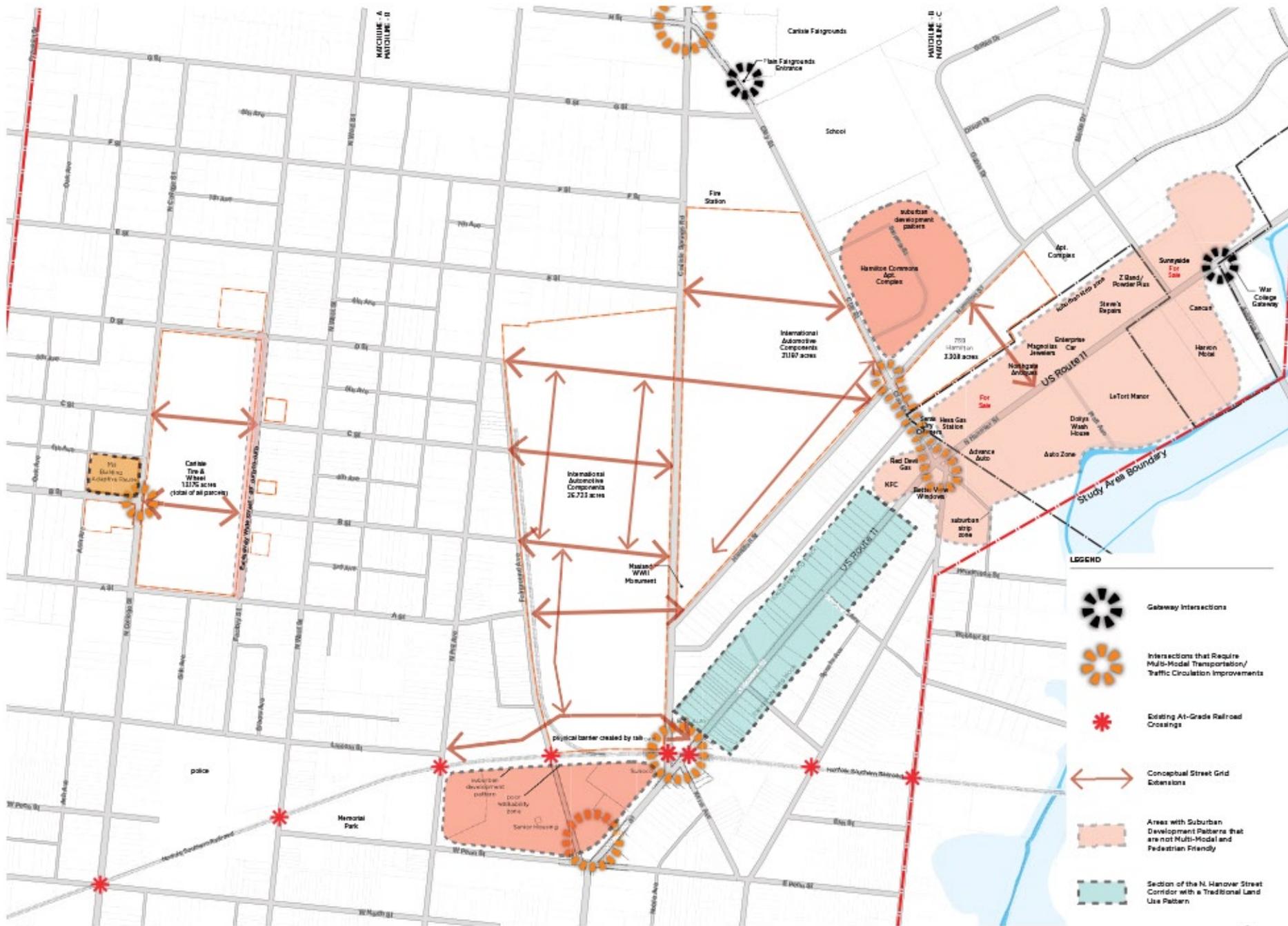
The study area's existing system of pedestrian connections is largely comprised of a mix of public (but privately maintained) sidewalks and alleyways that parallel the existing gridded street network. Sidewalks exist on the majority of the study area's arterial, collector, and local roadways but sidewalks are mostly non-existent on mid-block streets comprised of avenues and alleyways. Crosswalks are prevalent at the majority of the major street intersections. Crosswalk compliance with the Americans with Disabilities Act is a priority for the Borough's Community Development Block Grant program investments and the retro-fit of existing streets in the northwest quadrant neighborhood should continue until full compliance is achieved.

Overall, the existing street network reflects a vehicular-focused design orientation that favors motorists over pedestrians. For example, the majority of the existing sidewalks parallel existing residential and non-residential properties and as such, provide a continuous and extensive length of non-open space connections that are necessary to promoting a walkable community that is supported by frequent "stop and relax" opportunities. With the exception of on-street parking and the downtown Road Diet improvements, the existing street network is largely deficient of traffic calming and ample pedestrian and bicycle facilities.

The urban-form design vision for the proposed redevelopment sites, as defined by the community, Borough staff and refined by the design team during and after the community planning and design workshop, build on this fundamental approach of "complete" streets and thoroughfares following a traditional gridded pattern to reconnect the large former industrial sites back into the overall block structure of the town. The Borough desires a return to a more walkable structure, with a variety of housing types, places to shop and dine, and enhancement of civic centers within the study area. As one participant stated in the transportation topic meeting during the community planning and design workshop, "Why can't we design streets that attract and invite people into Carlisle instead of creating the quickest method for them to leave?" This urban design vision for a infrastructure element is directly linked to the transportation design criteria for the study area and the Borough as a whole. Neither urban design guidelines nor transportation design standards can accomplish this alone. The establishment of a fully walkable community requires managing traffic speeds to pedestrian-friendly levels and ensuring connectivity of the street and thoroughfare system for specific areas of the Borough, block-by-block.

Based on these principals, an analysis of the existing transportation system was performed with the following finding:

- Achieving a safe pedestrian and bicycle connection between PA Route 34/ Carlisle Springs Road and US Route 11/N. Hanover Street is extremely important to connect the IAC/Masland site redevelopment and the Fairgrounds activity to the downtown.
- Improvements are needed along U.S. Route 11/N. Hanover Street in the area between Penn Street and PA Route 34/Carlisle Springs Road to improve pedestrian and bicycle safety as well as improve crossing safety improvements at each intersection.
- The Penn Street, US Route 11/N. Hanover Street, Fairgrounds Avenue intersection needs significant improvement to increase traffic and pedestrian/bicycle safety. There are significant conflicts with turning movements and the flow of traffic from various directions.
- Fairground Avenue requires a comprehensive upgrade and should be studied as a two-way "complete" street.
- Implementing on-street, metered parking on PA Route 34/Carlisle Springs Road should be considered as part of a comprehensive streetscape upgrade.
- The intersection of Clay Street and U.S. Route 11/N. Hanover Street is problematic due to the awkward intersection alignment along with driveway access points close to the intersection.
- Discussions should occur with PennDOT regarding the options and ability to redesign PA Route 34/Carlisle Springs Road at least from U.S. Route 11/N. Hanover Street and Clay Street.
- B Street should be extended to connect to PA Route 34/Carlisle Springs Road and possibly Hamilton Street.
- Extending C or D Streets should also be considered to replicate the current street block units of the overall study area. The design of these streets should be looked at in the entirety including the existing sections with the new segments to form a single cohesive thoroughfare.
- Extending the Borough's Road Diet program with bike routes and dedicated bicycle facilities should be encouraged.
- PennDOT's 2014 has programmed to mill and resurfacing – U.S Route 11/N. Hanover Street (from High St. to the Pennsylvania Turnpike entrance) and PA Route 34/Carlisle Springs Road (from U.S. Route 11/N. Hanover Street to Calvary Road). Discussion should occur with PennDOT to determine if all of these improvements make sense with pending redevelopment activities. The Pennsylvania Turnpike Commission will also be reconstructing the PA Route 34/Carlisle Springs Road Bridge within the next few years.



Schematic Diagram of Key Transportation Patterns.



- Factory Street should be excessively wide and options to narrow or somehow utilize this right-of-way should be studied. Factory Street currently has very few buildings fronting it from A to D Streets. Its current 40' cartway is the result of a former railroad siding that served the Tire & Wheel plant.
- The intersection of G Street and PA Route 34/Carlisle Springs Road needs safety improvements given the high accident rates at this location. The Borough has taken corrective actions by removing a tree obstruction and increasing signage, but further improvements should be considered.
- Street Design Classifications – The Borough considers the following roadways collectors: West, Pitt, Bedford, East, Clay, South and Hamilton. E Street and a portion of B Street currently function as local roads.
- Additional bicycle and pedestrian facilities should be explored to serve the Hamilton School.
- The transit circulator project should be promoted and the routing should consider ways to serve the future redevelopment sites and surrounding neighborhoods.
- The Borough has an established wayfinding signing system which could provide additional directional information to connect the downtown with the redevelopment sites.

Freight Rail and At-Grade Crossings

The Norfolk Southern Railroad operates an active rail freight line that traverses the entire study area from east to west and provides freight shipments to a variety of industrial users located on the western portion of the Borough. The rail line includes 10 at-grade crossings with Borough streets with eight of these located within the study area boundaries. Of the eight crossings located within the project study area, the U.S. Route 11/N. Hanover Street and PA Route 34/Carlisle Springs Road crossings pose the most serious risk given that the two crossings are located immediately adjacent to each other at an oblique intersection. The risk imposed includes southbound traffic queuing on Carlisle Springs Road and on the railroad crossing. Although no reportable incidents are known to have occurred recently at these intersections, discussions with Norfolk Southern demonstrated the desire to eliminate at least one of the two crossings through the redevelopment process. Elimination of a crossing is the greatest level of protection that may be afforded.

In addition, the level of protection provided at the Fairgrounds Avenue crossing will become an increasingly important consideration through the redevelopment process given the importance that this street will have relative to traffic circulation and site accessibility.

To this end, it will be critically important for the Borough and private sector redevelopment parties to engage Norfolk Southern and the Pennsylvania Public Utilities Commission (PUC) during future traffic design studies and the redevelopment phases.

Parks, Recreation and Greenways

Memorial Park is the only major Borough Park located within the study area and it is approximately two acres in size. The park is heavily utilized and includes a mix of active court facilities and passive recreation opportunities. Memorial Park is also the location of the former Pennsylvania Railroad Station which has been restored and is now the home of Hope Station Organization. This organization's council oversees efforts and programs to lift up the entire neighborhood through education, technology, job development and most importantly, teaching children to become leaders by learning to respect themselves and others. The only other significant public open space within the study area is the Square. There are two large Borough owned open spaces, just north of the study area; the Cave Hill Natural Area and Shaffer Park. Connections to these areas should be enhanced to better serve the residents of the study area. The Stuart Community Center, the YWCA and the Carlisle Community Pool provide recreation opportunities for residents. The Dickinson College campus essentially functions as a major open space that is utilized by the northwest neighborhood. The Hamilton Street School is another public space that could function as a neighborhood park if site improvements are made.

The Borough has placed an emphasis on improving bicycle and pedestrian circulation and access as a way to increase connectivity throughout the town, for both transportation and recreational purposes. The Borough adopted a Bike and Pedestrian Trail Plan which includes proposed routes on N. West Street, G Street and Clay Street within the study area.

As redevelopment plans are developed they should include significant public open spaces in the form of urban parks/plazas, neighborhood parks with small footprint active recreation, such as tot lots, ball courts, skate parks, spray pads, dog parks, as well as community gardens and natural areas.

The proposed pedestrian and bicycle network improvements should be included and further expanded. All new streets should consider a complete palette of pedestrian and bicycle facilities to expand connectivity as much as possible.

Historic/Cultural Resources and Special Districts

Carlisle is rich in historical and cultural resources and its wealth of significant history permeates the overall character of the town, in elements such as its plan with a central square to its architecture and traditional neighborhoods. The preservation and interpretation of historic resources is a priority amongst citizens. A significant amount of the downtown is included within an historic district which extends north to Louther Street and includes the blocks fronting onto N. Hanover Street, north to Penn Street.

Cumberland County Historical Society (CCHS) is a leader in historic preservation and education of regional history, including directing walking tours of the Borough. The CCHS also operates History on High - The Shop and the Cumberland Valley Visitors Center which are located at 33 West High Street in the heart of downtown Carlisle's historic district. Historic Carlisle, Inc. is a non-profit corporation whose mission is to recognize and promote the history of Carlisle and Cumberland County. Each year, Historic Carlisle, Inc. arranges events ranging from the installation and dedication of new Historic Markers and the Carlisle Summerfair Historic Walking Tours.

There are two historic markers worth noting within the study area. The Lincoln Cemetery Monument on N. Pitt Avenue between Penn and Lincoln Streets and the Masland Employee WWII Memorial located at the intersection of Carlisle Springs Road and Hamilton Street.

An Elm Street District exists which extends from the downtown to A Street within the study area. The Downtown Neighborhood Connection is a community board which manages the Elm Street district and focuses on neighborhood strengthening programs under the advisement of Borough and CCHRA leadership. These comprehensive goals are implemented by the DNC Board, various neighborhood associations, and a full-time Elm Street Manager which is administratively managed by the DCA. The Elm Street Program focuses on strengthening residential neighborhoods, with an emphasis on encouraging home-ownership, rehabilitating older buildings, improving older neighborhoods and avoiding blight. These programs are especially important in focusing on the rehabilitation of older residential properties in the northwest neighborhood, as redevelopment occurs on the former industrial sites, to ensure that investment is occurring throughout the study area, and not only on the redevelopment site.